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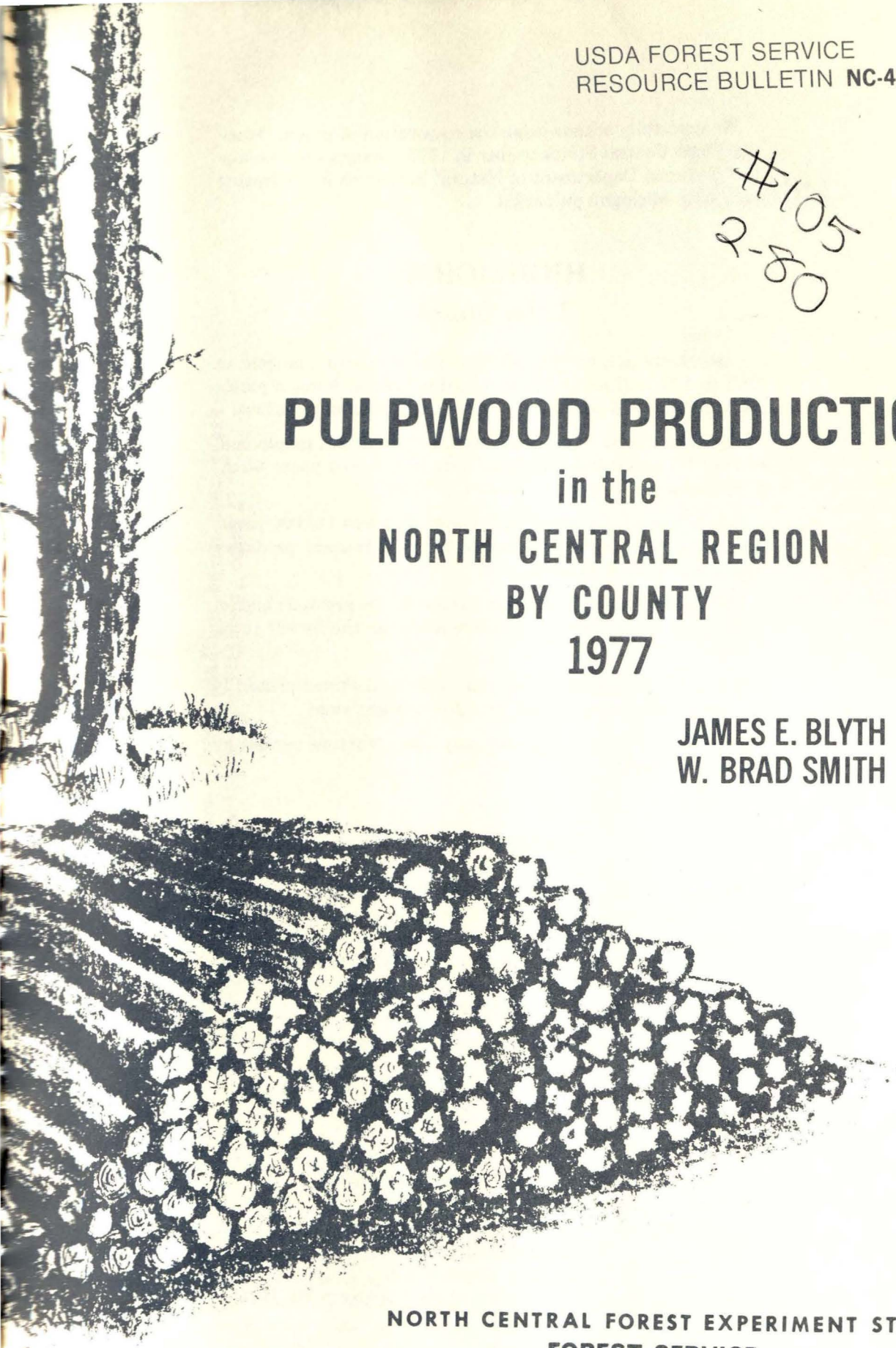

PULPWOOD PRODUCTION
in the
NORTH CENTRAL REGION
BY COUNTY
1977

JAMES E. BLYTH
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NORTH CENTRAL FOREST EXPERIMENT STATION
FOREST SERVICE
U. S. DEPARTMENT OF AGRICULTURE

We gratefully acknowledge the cooperation of pulpmills using North Central States timber in 1977. Thanks are also due the Michigan Department of Natural Resources for collecting data from Michigan pulpmills.

HIGHLIGHTS

Lake States

Lake States pulpwood production inched ahead 1 percent in 1977 to 4.74 million cords. Increased pulpwood demand paralleled the national increase in paper and paperboard output.

Significant production gains were in aspen, soft maple, and balsam fir; noteworthy declines were in elm and paper birch. Elm production may have peaked in 1976.

Whole tree chip production for pulpwood was 145,000 cords, primarily from aspen. Minnesota is the dominant producer; none came from Wisconsin.

Pine production in Wisconsin surpassed the previous high of 1974; the spruce harvest in Minnesota was the lowest in 32 years.

Softwood residue imports from Canada, destined primarily for Wisconsin, increased for the fifth straight year.

Lake States pulping capacity may rise 1,000 tons per day by the early 1980's.

Central States

Although demand for Central States pulpwood fell 4 percent, loggers cut a record volume of softwoods. Pine plantations in Illinois were the principal source. Output of soft hardwood continued to decline. Two-thirds of the hardwood production was from residue. More than half of the pulpwood produced was shipped outside the Central States.

Pulpwood receipts fell 9 percent; 15 percent came from other regions.

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1979

We goofed!

Please paste or tape the column headings below over those printed incorrectly on Table 9, continued, page 21.

UNIT AND COUNTY 1/	BEECH	WHITE BIRCH	YELLOW BIRCH	COTTON-WOOD	ELM	HICKORY	HARD MAPLE	SOFT MAPLE	RED OAK	WHITE OAK	OTHER HARD-WOODS	ALL SPECIES

PULPWOOD PRODUCTION IN THE NORTH CENTRAL REGION BY COUNTY, 1977

James E. Blyth, *Principal Market Analyst,*
and **W. Brad Smith,** *Associate Mensurationist*

This is the 19th annual report of the pulpwood harvest in Lake States counties and the 18th annual report of the Central States harvest. Pulpwood constitutes more than half the timber products harvested annually in the Lake States (Michigan, Minnesota, and Wisconsin) and is an important product in the Central States (Illinois, Indiana, Iowa, and Missouri).

Current detailed pulpwood production[1] information is necessary for intelligent planning and decisionmaking in wood procurement, forest resource management, and forest industry development. Also, researchers need current pulpwood information for planning projects.

Pulpmills using North Central States timber in 1977 reported their pulpwood receipts by species groups and counties of origin. This report presents the results of the survey, analyzes the data where appropriate, compares results with 1976 or earlier years, and discusses trends in pulpwood production and use.

The Lake States and Central States are discussed separately because the timber types in each area are different and less information can be released about the Central States (more detailed data on pulpwood production and receipts in the Central States would reveal the operations of individual mills).

[1]*Pulpwood production, determined from mill receipts, is the annual volume of pulpwood cut in a specific county or region, plus the annual wood residue volume produced by sawmills, veneer mills, etc., in a specific State or region that was used for pulp manufacturing. Pulpwood receipts are the volume of wood received by mills in a specific State or region, regardless of the geographic source.*

Pulpwood production in Minnesota is completely and accurately shown. However, to prevent disclosure of confidential information about softwood pulpwood use by individual companies, the total quantity of softwood pulpwood imports into Minnesota from Canada and exports from Minnesota to Canada are not reported. Thus, some Minnesota softwood shipped to Canada is shown as remaining and used in Minnesota, and receipts of Canadian softwood in Minnesota are understated.

LAKE STATES

Production

Lake States pulpwood production inched up 1 percent in 1977 to 4.74 million cords (table 1). Pulpwood demand was stimulated by a parallel advance of 1 percent in national paper and paperboard output in 1977.

Eighty-nine of every 100 cords produced were roundwood (including chips from roundwood); the remainder was residue from local wood-using plants.[2] Most (86 percent) of the production gain in 1977 came from residue. Of the total production, only 70,000 cords were shipped out of the Lake States.

Although the roundwood harvest rose nominally, several species recorded significant gains including aspen (68,000 cords), soft maple (33,000 cords) and balsam fir (29,000 cords). Major declines were in elm (55,000 cords) and white birch

[2]*Residue is the byproduct from sawmills, veneer mills, cooperage mills, and other wood-using plants that is used for pulping. Residue includes slabs, edgings, veneer cores, sawdust, wood flour, and chips manufactured from slabs, edgings, and veneer cores.*

Table 1.—*Production and imports of pulpwood, Lake States, 1977*
(In standard cords, unpeeled)

SPECIES AND DESTINATION	PRODUCTION BY STATES 1/				IMPORTS			TOTAL RECEIPTS
	MICHIGAN	MINNESOTA	WISCONSIN	REGIONAL TOTAL	OTHER U.S. 2/	CANADA	TOTAL IMPORTS	
CEDAR								
MICHIGAN	6663	0	1270	7933	0	0	0	7933
TOTAL	6663	0	1270	7933	0	0	0	7933
BALSAM FIR								
MICHIGAN	44463	0	7336	51799	0	0	0	51799
MINNESOTA	0	94249	0	94249	0	0	0	94249
WISCONSIN	41650	1114	65995	108759	0	0	0	108759
EXPORTED 3/	8362	3803	0	12165	0	0	0	0
TOTAL	94475	99166	73331	266972	0	0	0	254807
HEMLOCK								
MICHIGAN	51889	0	10212	62101	0	0	0	62101
WISCONSIN	10187	0	33259	43446	0	0	0	43446
TOTAL	62076	0	43471	105547	0	0	0	105547
JACK PINE								
MICHIGAN	124790	0	10535	135325	0	0	0	135325
MINNESOTA	0	132005	0	132005	0	1957	1957	133962
WISCONSIN	58660	25749	179259	263668	4/ 37614	0	37614	301282
EXPORTED 3/	0	3911	0	3911	0	0	0	0
TOTAL	183450	161665	189794	534909	37614	1957	39571	570569
RED PINE								
MICHIGAN	56762	0	4560	61322	0	0	0	61322
MINNESOTA	0	5436	0	5436	0	0	0	5436
WISCONSIN	8952	2917	88742	100611	0	0	0	100611
TOTAL	65714	8353	93302	167369	0	0	0	167369
WHITE PINE								
MICHIGAN	9482	0	2130	11612	0	0	0	11612
MINNESOTA	0	3356	0	3356	0	0	0	3356
WISCONSIN	3216	22	11285	14523	0	0	0	14523
TOTAL	12698	3378	13415	29491	0	0	0	29491
SPRUCE								
MICHIGAN	22272	0	2538	24810	0	0	0	24810
MINNESOTA	0	125424	0	125424	0	0	0	125424
WISCONSIN	18848	26124	16065	61037	0	32946	32946	93983
EXPORTED 3/	6743	1512	0	8255	0	0	0	0
TOTAL	47863	153060	18603	219526	0	32946	32946	244217
TAMARACK								
MICHIGAN	1415	0	484	1899	0	0	0	1899
MINNESOTA	0	15773	0	15773	0	0	0	15773
WISCONSIN	1455	26145	3495	31095	0	21	21	31116
TOTAL	2870	41918	3979	48767	0	21	21	48788
ASH								
MICHIGAN	9303	0	49	9352	0	0	0	9352
WISCONSIN	5360	46	20327	25733	0	0	0	25733
EXPORTED 3/	0	0	116	116	0	0	0	0
TOTAL	14663	46	20492	35201	0	0	0	35085
ASPEN								
MICHIGAN	368607	0	1207	369814	0	0	0	369814
MINNESOTA	0	612421	10650	623071	0	476	476	623547
WISCONSIN	163398	67827	683702	914927	0	0	0	914927
EXPORTED 3/	0	16600	665	17265	0	0	0	0
TOTAL	532005	696848	696224	1925077	0	476	476	1908288
BALSAM POPLAR								
MICHIGAN	19474	0	0	19474	0	0	0	19474
MINNESOTA	0	14652	0	14652	0	0	0	14652
WISCONSIN	0	0	55	55	0	0	0	55
TOTAL	19474	14652	55	34181	0	0	0	34181

(TABLE 1 CONTINUED ON NEXT PAGE)

(TABLE 1 CONTINUED)

SPECIES AND DESTINATION	PRODUCTION BY STATES 1/				IMPORTS			TOTAL RECEIPTS
	MICHIGAN	MINNESOTA	WISCONSIN	REGIONAL TOTAL	OTHER U.S. 2/	CANADA	TOTAL IMPORTS	
BASSWOOD								
MICHIGAN	3677	0	33	3710	0	0	0	3710
MINNESOTA	0	2000	0	2000	0	0	0	2000
WISCONSIN	48	0	7873	7921	0	0	0	7921
EXPORTED 3/	0	0	273	273	0	0	0	0
TOTAL	3725	2000	8179	13904	0	0	0	13631
BEECH								
MICHIGAN	9439	0	0	9439	0	0	0	9439
WISCONSIN	407	0	9	416	0	0	0	416
TOTAL	9846	0	9	9855	0	0	0	9855
WHITE BIRCH								
MICHIGAN	40747	0	721	41468	0	0	0	41468
MINNESOTA	0	27325	0	27325	0	0	0	27325
WISCONSIN	4443	2715	90401	97559	0	0	0	97559
EXPORTED 3/	0	0	223	223	0	0	0	0
TOTAL	45190	30040	91345	166575	0	0	0	166352
YELLOW BIRCH								
MICHIGAN	6551	0	177	6728	0	0	0	6728
WISCONSIN	10439	3	11591	22033	0	0	0	22033
TOTAL	16990	3	11768	28761	0	0	0	28761
COTTONWOOD								
EXPORTED 3/	0	0	44	44	0	0	0	0
TOTAL	0	0	44	44	0	0	0	0
ELM								
MICHIGAN	5572	0	168	5740	0	0	0	5740
MINNESOTA	0	2263	0	2263	0	0	0	2263
WISCONSIN	18713	59	150095	168867	0	0	0	168867
EXPORTED 3/	0	0	512	512	0	0	0	0
TOTAL	24285	2322	150775	177382	0	0	0	176870
HICKORY								
WISCONSIN	0	0	776	776	0	0	0	776
EXPORTED 3/	0	0	253	253	0	0	0	0
TOTAL	0	0	1029	1029	0	0	0	776
HARD MAPLE								
MICHIGAN	32254	0	903	33157	0	0	0	33157
WISCONSIN	27713	526	57156	85395	0	0	0	85395
EXPORTED 3/	0	0	219	219	0	0	0	0
TOTAL	59967	526	58278	118771	0	0	0	118552
SOFT MAPLE								
MICHIGAN	77303	0	552	77855	0	0	0	77855
MINNESOTA	0	375	0	375	0	0	0	375
WISCONSIN	11748	289	81892	93929	0	0	0	93929
EXPORTED 3/	0	0	302	302	0	0	0	0
TOTAL	89051	664	82746	172461	0	0	0	172159
RED OAK								
MICHIGAN	94900	0	175	95075	0	0	0	95075
MINNESOTA	0	4705	0	4705	0	0	0	4705
WISCONSIN	50	0	43369	43419	0	0	0	43419
EXPORTED 3/	0	0	1657	1657	0	0	0	0
TOTAL	94950	4705	45201	144856	0	0	0	143199
WHITE OAK								
MICHIGAN	12395	0	0	12395	0	0	0	12395
MINNESOTA	0	190	0	190	0	0	0	190
WISCONSIN	0	0	8872	8872	0	0	0	8872
EXPORTED 3/	0	0	623	623	0	0	0	0
TOTAL	12395	190	9495	22080	0	0	0	21457
OTHER HARDWOODS								
MICHIGAN	2287	0	19	2306	0	0	0	2306
WISCONSIN	2801	0	6244	9045	0	0	0	9045
EXPORTED 3/	0	0	105	105	0	0	0	0
TOTAL	5088	0	6368	11456	0	0	0	11351

(TABLE 1 CONTINUED ON NEXT PAGE)

(TABLE 1 CONTINUED)

SPECIES AND DESTINATION	PRODUCTION BY STATES 1/				IMPORTS			TOTAL RECEIPTS
	MICHIGAN	MINNESOTA	WISCONSIN	REGIONAL TOTAL	OTHER U.S. 2/	CANADA	TOTAL IMPORTS	
TOTAL ROUNDWOOD								
MICHIGAN	1000245	0	43069	1043314	0	0	0	1043314
MINNESOTA	0	1040174	10650	1050824	0	2433	2433	1053257
WISCONSIN	388088	153536	1560462	2102086	37614	32967	70581	2172667
EXPORTED 3/	15105	25826	4992	45923	0	0	0	0
TOTAL	1403438	1219536	1619173	4242147	37614	35400	73014	4269238
RESIDUE, SOFTWOOD								
MICHIGAN	16136	0	962	17098	0	0	0	17098
MINNESOTA	0	31947	0	31947	15245	7815	23060	55007
WISCONSIN	517	0	47080	47597	189497	62232	251729	299326
EXPORTED 3/	4110	3387	0	7497	0	0	0	0
TOTAL	20763	35334	48042	104139	204742	70047	274789	371431
RESIDUE, HARDWOODS								
MICHIGAN	142849	0	20437	163286	9406	0	9406	172692
MINNESOTA	0	77152	15633	92785	4007	4769	8776	101561
WISCONSIN	17967	544	105974	124485	0	0	0	124485
EXPORTED 3/	9969	253	6538	16760	0	0	0	0
TOTAL	170785	77949	148582	397316	13413	4769	18182	398738
ALL WOOD MATERIAL								
MICHIGAN	1159230	0	64468	1223698	9406	0	9406	1233104
MINNESOTA	0	1149273	26283	1175556	19252	15017	34269	1209825
WISCONSIN	406572	154080	1713516	2274168	227111	95199	322310	2596478
EXPORTED 3/	29184	29466	11530	70180	0	0	0	0
TOTAL	1594986	1332819	1815797	4743602	255769	110216	365985	5039407

1/ VERTICAL COLUMNS OF FIGURES UNDER BOX HEADING -PRODUCTION BY STATES- PRESENT THE AMOUNT OF PULPWOOD CUT IN EACH STATE
2/ MOSTLY WESTERN STATES.
3/ PULPWOOD SHIPPED TO MILLS OUTSIDE OF REGION.
4/ PONDEROSA PINE.

(29,000 cords). Dutch elm disease has destroyed much of the elm resource in Michigan's Lower Peninsula and in southern and central Wisconsin. Consequently, use of elm pulpwood may have peaked in 1976 in the Lake States.

Whole tree chip[3] production for pulpwood was 145,000 cords (3 percent of the total) in 1977. Production by species group and State was:

State	Softwoods	Aspen	Other hardwoods
	(In thousand cords)		
Michigan	2.6	28.4	15.9
Minnesota	—	96.4	1.4

None was produced in Wisconsin, although some experimental use of whole tree chips was tried at Wisconsin mills in the last 5 years. During the next decade, Wisconsin mills will probably use some whole tree chips again, particularly if competition for wood continues to increase.

[3]*Pulpwood produced from chipping entire trees (all portions of trees above ground, except the stumps).*

Whole tree chips are becoming important for fuelwood at some Lake States pulp mills, a use likely to accelerate. Yields from whole tree chips are generally 30 to 100 percent greater than from conventional logging operations. Mills may find whole tree chips attractive for fuel and pulpwood—the barky chips for fuel and the "clean" chips for pulpwood.

The rate of increase in whole tree chip use for pulpwood depends on changes in logging and pulp manufacturing technology, technology for separating bark from fiber, demand for forest products, the paper and paperboard product mix, and consumer tastes for end products.

Michigan.—Michigan furnished 1.59 million cords of pulpwood, up 54,000 cords from 1976 and surpassed only by the production of 1974. Harvest gains were concentrated in aspen, red oak, balsam fir, and spruce. All Michigan areas except the northern Lower Peninsula had larger harvests; the northern Lower Peninsula supplies more roundwood than any other Unit and is the most

stable area of production. Counties contributing more than 90,000 cords each of roundwood were Iron, Delta, Marquette, and Menominee.

Minnesota.—Production rose slightly (24,000 cords) to 1.33 million cords. Demand strengthened for aspen and balsam fir, but spruce output fell to the lowest level in 32 years. Pulpwood harvesting declined for the third consecutive year in the Northern Aspen-Birch Unit, but rose in each of the other Units. St. Louis, Koochiching, and Itasca Counties supplied 59 percent of the roundwood for pulpwood.

Wisconsin.—Producers lowered their output 24,000 cords to 1.82 million cords. Demand for pine surpassed the previous high in 1974. For the fifth consecutive year, demand for softwood residue from Wisconsin reached a new high. Production losses were primarily in central Wisconsin. Marinette, Oneida, and Florence Counties were the leading producers.

The distribution of the harvest is shown in two ways: first, the amount of pulpwood cut relative to the merchantable volume in major pulpwood species (fig. 1); and second, the amount of pulpwood cut relative to commercial forest area (fig. 2). Cutting pressure was heaviest (per 1,000 cords of merchantable volume in principal pulpwood species) in central and northeastern Wisconsin and Michigan's Upper Peninsula.

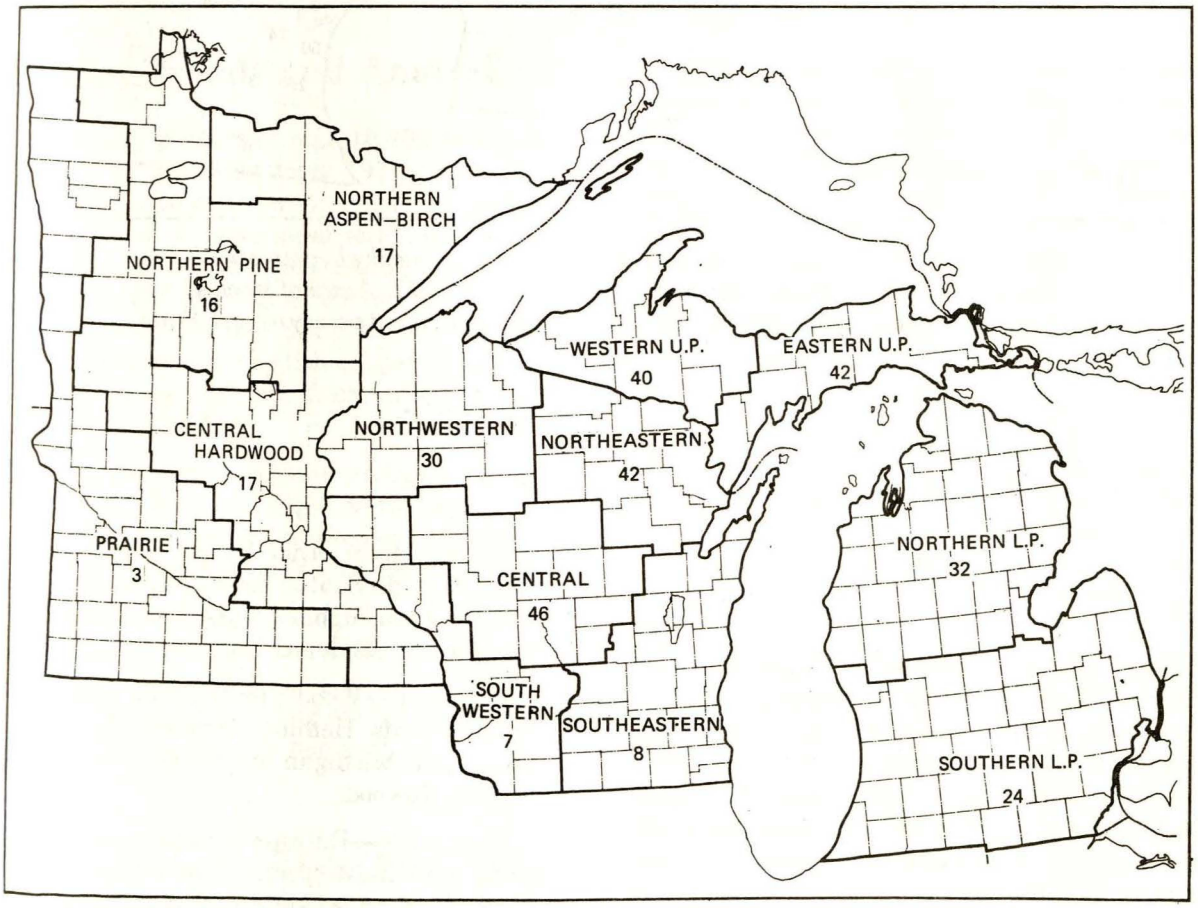


Figure 1.—*Cords of pulpwood bolts and logs harvested per 1,000 cords of merchantable volume in principal pulpwood species by Forest Survey Unit, 1977. (Heavy lines delineate the boundaries of the Forest Survey Units in each State.)*

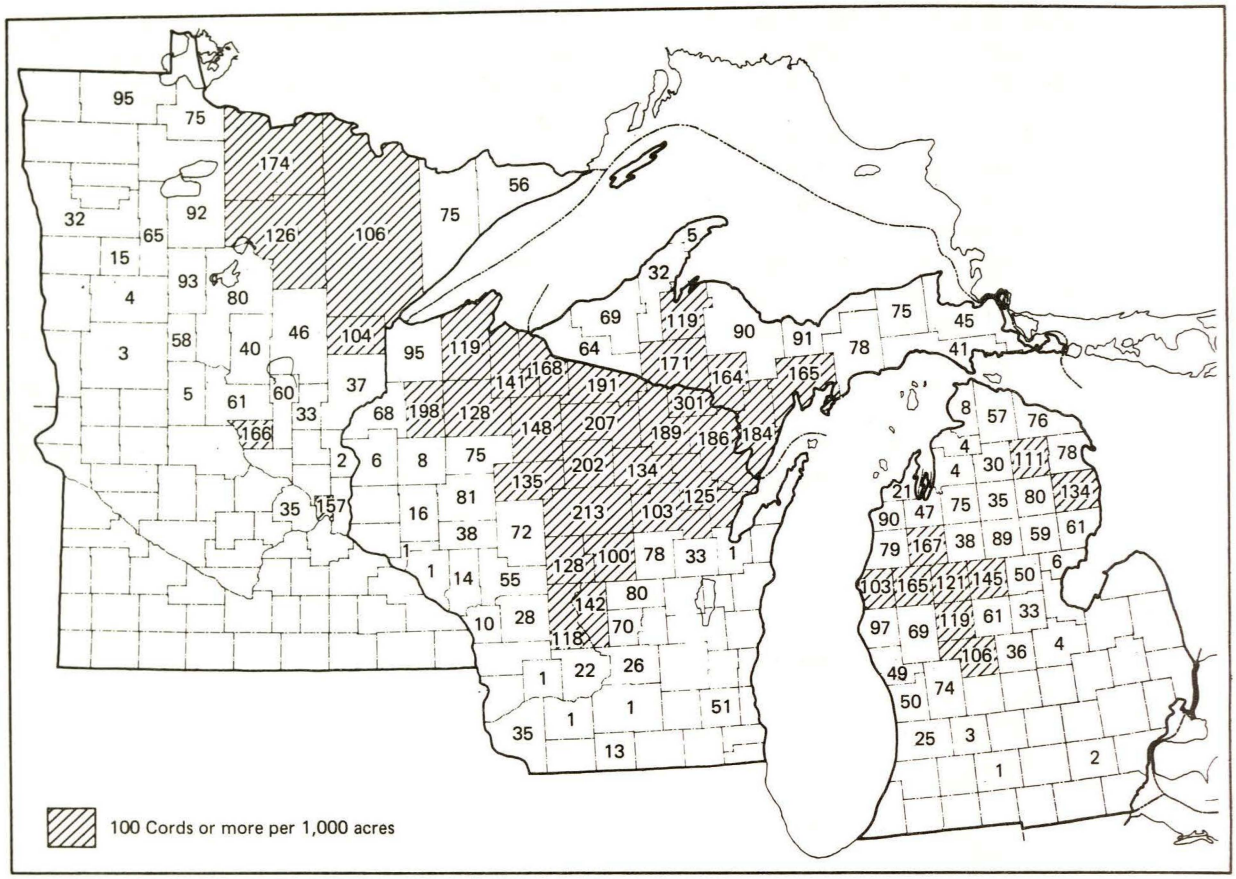


Figure 2.—*Cords of pulpwood cut per 1,000 acres of stocked commercial forest land in principal pulpwood-producing counties, 1977. Acres of stocked commercial forest land were determined during the last forest survey in each State.*

Receipts

Pulpwood producers shipped 5.04 million cords of pulpwood to 41 Lake States pulpmills in 1977. Of these mills, 36 used aspen, including all mills in Michigan and Minnesota (table 2). Softwood residue receipts climbed to a record level of 371,000 cords. Other major gains were in aspen and soft maple. Receipts of elm and white birch dropped more than 25,000 cords.

For the fifth consecutive year, Canada increased shipments of softwood residue to the Lake States; Wisconsin continued to be the primary market.

Imports from other States rose 8 percent to 256,000 cords. South Dakota, Wyoming, Colorado, and Montana supplied four-fifths of these imports as softwood residue chips.

Michigan.—Wood procurement spurted ahead 119,000 cords. Hemlock demand was the highest since 1951. Michigan sources provided 95 percent of the pulpwood.

Wisconsin.—Pulpwood receipts fell 116,000 cords with most species contributing to the decline. Hemlock and spruce demand hit new lows, spruce for the fourth year in a row. In contrast, deliveries of softwood residue were 20,000 cords higher than in any other year.

Table 2.—*Industrial plants using the different species of wood for pulping in 1977*
(In numbers)

Species and kind of material	Lake States	Michigan	Minnesota	Wisconsin
Aspen	36	8	9	19
Balsam fir	17	3	5	9
Birch	19	5	3	11
Hemlock	8	2	—	6
Pine	9	3	2	4
Spruce	18	2	5	11
Tamarack	7	1	2	4
Maple	15	6	—	9
Oak	12	5	1	6
Other hardwoods	17	6	2	9
Wood chips (residue)	20	6	6	8
Slabwood and other residue	5	—	2	3
Total Plants[1]	41	8	9	24

[1]Some plants use more than one species, so numbers in columns cannot be added.

Industry Trends and Analysis

Average daily production was 10,800 tons per day, a gain of 200 tons from 1976 (table 3). Ownership changed at one mill; no mills closed or began operations. If announced mill expansions and new mill construction are realized, pulping capacity will increase about 1,000 tons per day by the early 1980's. Increased competition for wood will also likely come from additional particleboard and waferboard capacity and from mills burning roundwood chips for fuel.

The average annual volume of Lake States softwood residue used as pulpwood in 1975-1977 was double the average volume used in 1970-1972. This trend will probably continue, perhaps at a lower rate.

During the last decade, demand for hemlock declined at Wisconsin mills and increased at Michigan mills. These compensating shifts resulted in relatively stable harvests of hemlock.

CENTRAL STATES

Production

Demand for Central States pulpwood fell 4 percent to 445,000 cords in 1977 (table 4). However, Central States loggers cut a record volume of softwoods. Pine plantations in Illinois are maturing and providing pulpwood from commercial thinnings. For the fifth straight year, soft hardwood production dropped and was about half the annual volume cut between 1967 and 1973. Hard hardwood harvesting declined to 64,000 cords. Demand remained firm for pulpwood from wood residue generated at Central States wood-using mills; hardwood residue comprised two-thirds of total production.

Exports from the Central States rose 10,000 cords, the fourth straight annual increase. More than half (53 percent) of total pulpwood production was shipped outside the Central States to Kentucky, Ohio, Michigan, and Minnesota. About three-fourths (76 percent) of the exports was hardwood residue. To remain competitive with mills in other areas, Illinois, Indiana, and Missouri sawmills depend on these pulpwood export markets for their residue.

Indiana continued as the leading pulpwood producer followed in order by Missouri, Illinois, and Iowa (the only State to increase production). Only 13 percent of Missouri's production was roundwood.

Loggers cut pulpwood in 82 counties: 29 in Illinois, 27 in Indiana, 17 in Missouri, and 9 in Iowa (fig. 3). Harvest areas expanded in west central

Table 3.—*Active wood pulp mills in the Lake States by location, type of pulp produced, and average daily production, 1977*

COMPANY	LOCATION	AVERAGE PRODUCTION IN TONS PER 24 HOURS 1/				
		TOTAL	SULFITE	SULFATE	GROUNDWOOD AND OTHER MECHANICAL	SEMI-CHEMICAL
MICHIGAN:						
ABITIBI CORP.	ALPENA	430	0	0	430	0
CELOTEX CORP.	L ANSE	270	0	0	270	0
HOERNER WALDORF CORP.	ONTONAGON	440	0	0	0	440
MANISTIQUE PULP AND PAPER CO.	MANISTIQUE	90	0	0	90	0
MEAD CORP.	ESCANABA	750	0	600	150	0
MENASHA CORP.	OTSEGO	225	0	0	0	225
PACKAGING CORP.OF AMERICA	FILER CITY	600	0	0	0	600
WARREN CO., S.D.	MUSKEGON	250	0	250	0	0
TOTAL.....	8 PLANTS.....	3055	0	850	940	1265
MINNESOTA :						
BLANDIN PAPER CO.	GRAND RAPIDS	350	0	0	350	0
HENNEPIN PAPER CO.	LITTLE FALLS	75	0	0	75	0
BOISE CASCADE CORP.	INTERNATIONAL FALLS	880	0	340	540	0
POTLATCH CORP.	CLOQUET	440	0	440	0	0
SUPERWOOD CORP.	BEMIDJI	90	0	0	90	0
ST REGIS PAPER CO.	SARTELL	125	0	0	125	0
SUPERWOOD CORP.	DULUTH	350	0	0	350	0
HOERNER WALDORF CORP.	ST PAUL	300	0	0	0	300
CONWED CORP.	CLOQUET	350	0	0	350	0
TOTAL.....	9 PLANTS.....	2960	0	780	1880	300
WISCONSIN :						
AMERICAN CAN CO.	GREEN BAY	210	150	0	60	0
WEYERHAEUSER CO.	ROTHSCHILD	200	200	0	0	0
BADGER PAPER MILLS	PESHTIGO	110	110	0	0	0
NCR,APPLETON PAPER DIV.	COMBINED LOCKS	200	0	0	200	0
CONSOLIDATED PAPERS , INC.	APPLETON	130	130	0	0	0
CONSOLIDATED PAPERS , INC.	STEVENS POINT	100	0	0	100	0
CONSOLIDATED PAPERS , INC.	WISCONSIN RAPIDS	720	0	475	245	0
GREEN BAY PACKAGING, INC.	GREEN BAY	200	0	0	0	200
FLAMBEAU PAPER CO.	PARK FALLS	115	115	0	0	0
MIDTEC PAPER CORP.	KIMBERLY	115	0	0	115	0
PENTAIR INDUSTRIES	NIAGARA	170	0	0	170	0
MOSINEE PAPER MILLS CO.	MOSINEE	175	0	175	0	0
NEKOOSA PAPERS INC.	NEKOOSA	310	0	310	0	0
NEKOOSA PAPERS INC.	PORT EDWARDS	215	215	0	0	0
OWENS-ILLINOIS	TOMAHAWK	620	0	0	0	620
PROCTER AND GAMBLE INC.	GREEN BAY	2/	2/	2/	2/	2/
SCOTT PAPER CO.	OCONTO FALLS	115	115	0	0	0
ST REGIS PAPER CO.	RHINELANDER	75	75	0	0	0
FLINKOTE COMPANY	CORNELL	100	0	0	100	0
SUPERIOR FIBRE PRODUCTS CO.	SUPERIOR	180	0	0	180	0
THILMANY PULP AND PAPER CO	KAUKAUNA	400	0	400	0	0
TOMAHAWK PULP CO., INC.	TOMAHAWK	50	0	0	50	0
WAUSAU PAPER MILLS CO.	BROKAW	185	185	0	0	0
BOISE CASCADE CORP.	PHILLIPS	100	0	0	100	0
TOTAL.....	24 PLANTS.....	4795	1295	1360	1320	820
ALL STATES	41 PLANTS	10810	1295	2990	4140	2385

1/ LOCKWOOD'S DIRECTORY OF THE PAPER AND ALLIED INDUSTRIES-1978
2/ CAPACITY NOT AVAILABLE.

Table 4.—*Production and imports of pulpwood, Central States, 1977*
(In standard cords, unpeeled)[1]

SPECIES AND DESTINATION	PRODUCTION BY STATES 2/					IMPORTS			TOTAL RECEIPTS
	ILLINOIS	INDIANA	IOWA	MISSOURI	REGIONAL TOTAL	LAKE STATES	OTHER U.S.	TOTAL IMPORTS	
SOFTWOODS									
ILLINOIS	8947	3476	0	200	12623	0	0	0	12623
EXPORTED 4/	5613	0	0	30	5643	0	0	0	0
TOTAL	14560	3476	0	230	18266	0	0	0	12623
SOFT HARDWOODS									
ILLINOIS	4126	2529	0	4454	11109	0	0	0	11109
IND.,IOWA,MO. 3/	4063	9958	16755	2313	33089	2124	0	2124	35213
EXPORTED 4/	4441	0	0	1937	6378	0	0	0	0
TOTAL	12630	12487	16755	8704	50576	2124	0	2124	46322
HARD HARDWOODS									
ILLINOIS	120	0	0	0	120	0	0	0	120
IND.,IOWA,MO. 3/	4872	9909	8436	939	24156	2868	0	2868	27024
EXPORTED 4/	8063	25155	0	6324	39542	0	0	0	0
TOTAL	13055	35064	8436	7263	63818	2868	0	2868	27144
TOTAL ROUNDWOOD									
ILLINOIS	13193	6005	0	4654	23852	0	0	0	23852
IND.,IOWA,MO. 3/	8935	19867	25191	3252	57245	4992	0	4992	62237
EXPORTED 4/	18117	25155	0	8291	51563	0	0	0	0
TOTAL	40245	51027	25191	16197	132660	4992	0	4992	86089
RESIDUE,SOFTWOOD									
ILLINOIS	1755	0	2006	4464	8225	6505	4197	10702	18927
IND.,IOWA,MO. 3/	0	0	0	0	0	0	4800	4800	4800
EXPORTED 4/	1893	0	0	3159	5052	0	0	0	0
TOTAL	3648	0	2006	7623	13277	6505	8997	15502	23727
RESIDUE,HARDWOODS									
ILLINOIS	24998	5014	0	1914	31926	11195	0	11195	43121
IND.,IOWA,MO. 3/	4491	34610	19067	29262	87430	5565	0	5565	92995
EXPORTED 4/	37766	69873	4007	68058	179704	0	0	0	0
TOTAL	67255	109497	23074	99234	299060	16760	0	16760	136116
ALL WOOD MATERIAL									
ILLINOIS	39946	11019	2006	11032	64003	17700	4197	21897	85900
IND.,IOWA,MO. 3/	13426	54477	44258	32514	144675	10557	4800	15357	160032
EXPORTED 4/	57776	95028	4007	79508	236319	0	0	0	0
TOTAL	111148	160524	50271	123054	444997	28257	8997	37254	245932

1/ FACTORS USED IN CONVERTING TO STANDARD GREEN CORDS (128 CU. FT.) WERE:
4,500 POUNDS OF SOFT HARDWOOD ROUNDWOOD;
5,000 POUNDS OF HARD HARDWOOD OR CONIFEROUS ROUNDWOOD;
4,100 POUNDS OF SOFTWOOD CHIPS (GREEN);
4,400 POUNDS OF HARDWOOD CHIPS (GREEN);
2,500 POUNDS OF CHIPS (ALL SPECIES,DRY).

2/ VERTICAL COLUMNS OF FIGURES UNDER BOX HEADING -PRODUCTION BY STATES- PRESENT THE AMOUNT OF PULPWOOD CUT IN EACH STATE.

3/ COMBINED TO PREVENT DISCLOSURE OF INDIVIDUAL MILL RECEIPTS.

4/ PULPWOOD SHIPPED TO MILLS OUTSIDE THE REGION.

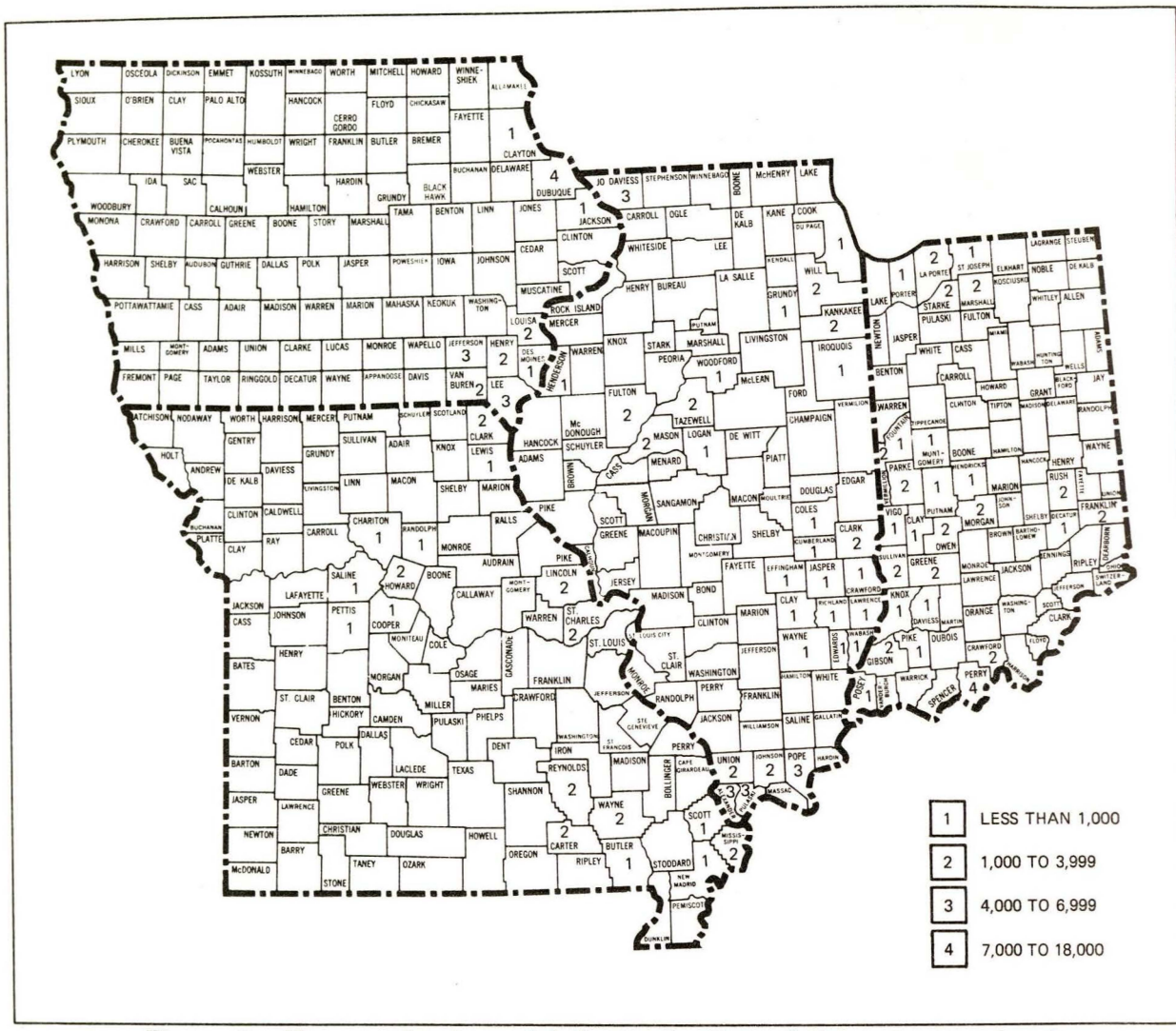


Figure 3.—*Harvest of pulpwood bolts in the Central States by counties, in standard cords, 1977.*

Illinois, northwestern Indiana, and southeastern Iowa; and contracted in southeastern Illinois, south central Indiana, central Iowa, and northeastern Missouri.

Receipts

Pulpwood receipts dipped to 246,000 cords at 12 Central States pulpmills, off 9 percent from 1976. These mills procured 15 percent of their wood from other regions. All roundwood and hardwood residue imports came from the Lake States. Softwood residues were imported from 12 States scattered throughout the United States.

Industry Trends and Analysis

Average daily pulp production remained at 1,100 tons (table 5). No significant changes in pulping capacity were announced, and mill ownership did not change.

In 1965 wood residue from Central States mills was first used for making pulp. Six years later,

mill residue became the major source of pulpwood in the Central States:

Year	Pulpwood Production from: Roundwood	Mill residue	All sources
	(In thousand cords)		
1965	204	27	231
1967	186	66	252
1969	187	189	376
1971	205	216	421
1973	199	255	454
1975	123	284	407
1977	133	312	445

Roundwood has declined as a pulpwood source because most Central States loggers are oriented toward saw log and veneer log production, woods labor is sometimes in short supply when demand for pulpwood is high, and logging costs have escalated.

Demand for pulpwood from mill residue has grown because sawmills and veneer mills usually have large quantities of residue available when pulpwood demand is heavy; new and rehabilitated sawmills often install equipment for manufacturing high-quality pulpwood chips; average production per sawmill has been increasing, allowing greater opportunities for producing chips profitably; and labor problems are less severe at mills than in the woods during peak demands for pulpwood.

One potential problem has surfaced recently for pulpmills—competition for mill residue from fuelwood markets. If the value of residue for fuel increases faster than the value for pulpwood, pulpmills may have to increase their procurement area if they still prefer residue to roundwood.

Table 5.—*Active woodpulp mills in the Central States by location, type of pulp produced, and average daily production, 1977*

COMPANY	LOCATION	AVERAGE PRODUCTION IN TONS PER 24 HOURS 1/ TOTAL	SULFITE	SULFATE	GROUNDWOOD AND OTHER MECHANICAL	SEMI-CHEMICAL
ILLINOIS:						
BIRD AND SON , INC.	CHICAGO	40	0	0	40	0
CELOTEX CORP.	PEORIA	90	0	0	90	0
CERTAIN-TEED PRODUCTS CORP.	EAST ST LOUIS	100	0	0	100	0
FLINTKOTE CO , THE	MT CARMEL	40	0	0	40	0
GAF CORP.	JOLIET	100	0	0	100	0
JOHNS-MANVILLE PRODUCTS CORP.	WAUKEGAN	50	0	0	50	0
CELOTEX CORP.	WILMINGTON	30	0	0	30	0
TOTAL.....	7 PLANTS.....	450	0	0	450	0
INDIANA :						
WESTON PAPER AND MFG. CO.	TERRE HAUTE	270	0	0	0	270
TOTAL.....	1 PLANT.....	270	0	0	0	270
IOWA :						
CELOTEX CORP.	DUBUQUE	90	0	0	90	0
CONSOLIDATED PACKAGING CORP.	FORT MADISON	140	0	0	0	140
TOTAL.....	2 PLANTS.....	230	0	0	90	140
MISSOURI :						
GAF CORP.	KANSAS CITY	90	0	0	90	0
HUEBERT FIBREBOARD, INC.	BOONEVILLE	60	0	0	60	0
TOTAL.....	2 PLANTS.....	150	0	0	150	0
ALL STATES	12 PLANTS	1100	0	0	690	410

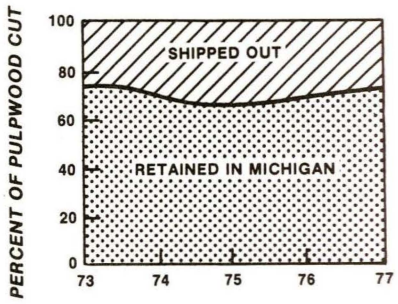
1/ LOCKWOOD'S DIRECTORY OF THE PAPER AND ALLIED INDUSTRIES-1978

APPENDIX

Table 6.—*Lake States pulpwood production by State of origin and destination, 1973-1977*
(In thousand standard cords, roughwood basis)

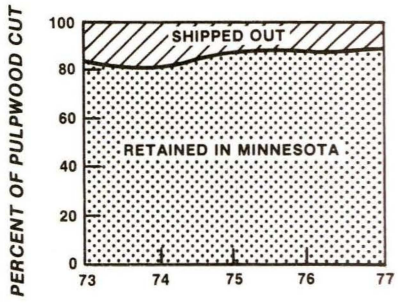
MICHIGAN

	Total cut	Destination of pulpwood: Minnesota	Wisconsin	Michigan	Other
1973	1,585	—	418	1,131	36
1974	1,843	—	534	1,290	19
1975	1,280	—	449	814	17
1976	1,541	—	434	1,081	26
1977	1,595	—	407	1,159	29
5-year average	1,569	—	449	1,095	25



MINNESOTA

	Total cut	Destination of pulpwood: Minnesota	Wisconsin	Michigan	Other
1973	1,376	1,152	194	(1)	30
1974	1,578	1,297	262	(1)	19
1975	1,359	1,173	178	—	8
1976	1,309	1,109	182	—	18
1977	1,333	1,149	154	—	30
5-year average	1,391	1,176	194	—	21



WISCONSIN

	Total cut	Destination of pulpwood: Minnesota	Wisconsin	Michigan	Other
1973	1,758	14	1,671	55	18
1974	2,053	14	2,004	25	10
1975	1,505	20	1,460	19	6
1976	1,840	23	1,784	24	9
1977	1,816	26	1,714	64	12
5-year average	1,794	19	1,727	37	11

[1]Less than 500 cords.

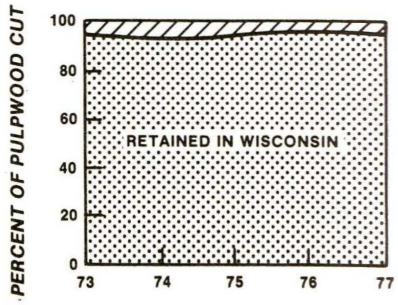


Table 7.—*Lake States pulpwood production from roundwood by Forest Survey Unit and destination by State, 1977*
(In hundred standard cords, roughwood basis)

MICHIGAN

UNIT	TOTAL CUT	DESTINATION OF PULPWOOD			
		MICHIGAN	MINNESOTA	WISCONSIN	OTHER
E. UPPER PENINSULA	3896	2516	0	1237	143
W. UPPER PENINSULA	4582	2071	0	2511	0
N. LOWER PENINSULA	5162	5021	0	133	8
S. LOWER PENINSULA	394	394	0	0	0
TOTAL ROUNDWOOD	14034	10002	0	3881	151
TOTAL RESIDUES	1916	1590	0	185	141
TOTAL	15950	11592	0	4066	292

MINNESOTA

UNIT	TOTAL CUT	DESTINATION OF PULPWOOD			
		MICHIGAN	MINNESOTA	WISCONSIN	OTHER
NORTHERN ASPEN-BIRCH	6934	0	5878	798	258
NORTHERN PINE	4798	0	4102	696	0
CENTRAL HARDWOOD	440	0	422	18	0
PRAIRIE	24	0	0	24	0
TOTAL ROUNDWOOD	12196	0	10402	1536	258
TOTAL RESIDUES	1132	0	1091	5	36
TOTAL	13328	0	11493	1541	294

WISCONSIN

UNIT	TOTAL CUT	DESTINATION OF PULPWOOD			
		MICHIGAN	MINNESOTA	WISCONSIN	OTHER
NORTHEASTERN	7159	303	0	6856	0
NORTHWESTERN	6078	104	107	5867	0
CENTRAL	2753	24	0	2729	0
SOUTHWESTERN	131	0	0	81	50
SOUTHEASTERN	71	0	0	71	0
TOTAL ROUNDWOOD	16192	431	107	15604	50
TOTAL RESIDUES	1966	214	156	1531	65
TOTAL	18158	645	263	17135	115

Table 8.—*Lake States pulpwood production from roundwood by species, State, and Forest Survey Unit, 1973-1977*

(In thousand standard cords, roughwood basis)

Unit	Aspen					Balsam fir				
	Annual Production					Annual Production				
	1973	1974	1975	1976	1977	1973	1974	1975	1976	1977
MICHIGAN										
E. ½ Upper Peninsula	93	119	68	93	106	41	40	36	41	48
W. ½ Upper Peninsula	225	294	138	176	195	26	32	34	31	45
N. ½ Lower Peninsula	275	282	228	216	222	2	2	4	3	2
S. ½ Lower Peninsula	10	11	1	6	9	—	—	—	—	—
Total	603	706	435	491	532	69	74	74	75	95
MINNESOTA										
Northern aspen-birch	407	460	357	372	375	37	52	76	44	60
Northern pine	228	282	236	276	292	28	41	45	30	39
Central hardwood	38	62	22	25	30	(1)	—	—	(1)	—
Prairie	—	—	—	—	—	—	—	—	—	—
Total	673	804	615	673	697	65	93	121	74	99
WISCONSIN										
Northeastern	380	383	286	345	334	34	49	64	61	57
Northwestern	331	342	276	308	329	32	35	33	26	15
Central	46	71	25	38	31	1	1	1	2	1
Southwestern	3	1	—	—	1	—	—	—	—	—
Southeastern	1	(1)	1	2	1	—	—	—	—	—
Total	761	797	588	693	696	67	85	98	89	73
Lake States	2,037	2,307	1,638	1,857	1,925	201	252	293	238	267

Unit	Birch					Hemlock				
	Annual Production					Annual Production				
	1973	1974	1975	1976	1977	1973	1974	1975	1976	1977
MICHIGAN										
E. ½ Upper Peninsula	19	24	6	20	22	22	13	16	35	31
W. ½ Upper Peninsula	16	35	8	29	29	36	39	34	44	31
N. ½ Lower Peninsula	25	25	22	20	11	—	(1)	—	(1)	(1)
S. ½ Lower Peninsula	—	(1)	(1)	(1)	(1)	—	—	—	—	—
Total	60	84	36	69	62	58	52	50	79	62
MINNESOTA										
Northern aspen-birch	18	15	16	21	15	—	—	—	—	—
Northern pine	23	24	18	23	13	—	—	—	—	—
Central hardwood	1	5	2	2	2	—	—	—	—	—
Prairie	—	(1)	(1)	—	—	—	—	—	—	—
Total	42	44	36	46	30	—	—	—	—	—
WISCONSIN										
Northeastern	30	38	33	50	54	21	32	30	27	32
Northwestern	40	59	44	56	44	10	9	13	9	8
Central	1	5	6	8	5	1	3	3	7	3
Southwestern	1	(1)	(1)	—	(1)	—	—	—	—	—
Southeastern	—	(1)	(1)	(1)	(1)	(1)	1	(1)	—	—
Total	72	102	83	114	103	32	45	46	43	43
Lake States	174	230	155	229	195	90	97	96	122	105

(Table 8 continued on next page)

(Table 8 continued)

Unit	Pine Annual Production 1973	1974	1975	1976	1977	Spruce Annual Production 1973	1974	1975	1976	1977
MICHIGAN										
E. ½ Upper Peninsula	67	87	59	88	82	28	19	18	17	27
W. ½ Upper Peninsula	36	36	25	43	49	18	20	25	14	21
N. ½ Lower Peninsula	88	127	143	140	119	(1)	1	2	1	(1)
S. ½ Lower Peninsula	12	9	8	10	12	—	—	—	—	—
Total	203	259	235	281	262	46	40	45	32	48
MINNESOTA										
Northern aspen-birch	125	139	116	104	97	159	154	153	129	110
Northern pine	77	98	79	64	73	54	51	49	46	43
Central hardwood	3	2	4	4	4	(1)	(1)	—	(1)	(1)
Prairie	(1)	(1)	—	—	—	2	2	—	—	—
Total	205	239	199	172	174	215	207	202	175	153
WISCONSIN										
Northeastern	43	62	46	55	68	10	13	18	14	16
Northwestern	100	100	64	96	103	6	6	7	4	3
Central	85	125	122	124	113	—	(1)	(1)	1	*
Southwestern	3	2	2	5	8	—	—	—	—	—
Southeastern	1	2	5	6	4	—	(1)	—	—	—
Total	232	291	239	286	296	16	19	25	19	19
Lake States	640	789	673	739	732	277	266	272	226	220

Unit	Tamarack Annual Production 1973	1974	1975	1976	1977	Miscellaneous hardwoods Annual Production 1973	1974	1975	1976	1977
MICHIGAN										
E. ½ Upper Peninsula	2	1	1	(1)	2	93	124	35	82	69
W. ½ Upper Peninsula	3	1	1	1	1	123	148	57	88	84
N. ½ Lower Peninsula	—	—	—	0	—	145	144	124	147	162
S. ½ Lower Peninsula	—	—	—	0	—	5	8	2	3	18
Total	5	2	2	1	3	366	424	218	320	333
MINNESOTA										
Northern aspen-birch	14	25	31	19	24	29	24	12	19	12
Northern pine	17	18	25	17	15	2	6	7	7	5
Central hardwood	1	—	(1)	(1)	(1)	5	6	3	6	8
Prairie	1	(1)	(1)	1	3	—	(1)	—	—	—
Total	33	43	56	37	42	36	36	22	32	25
WISCONSIN										
Northeastern	1	1	2	2	2	150	183	89	158	152
Northwestern	(1)	1	1	1	1	104	140	81	122	104
Central	—	(1)	1	(1)	1	136	174	71	140	121
Southwestern	—	—	—	—	—	6	3	2	3	4
Southeastern	—	—	—	—	—	4	6	1	2	2
Total	1	2	4	3	4	400	506	244	425	383
Lake States	39	47	62	41	49	802	966	484	777	741

(Table 8 continued on next page)

(Table 8 continued)

Unit	All species[2] Annual Production				
	1973	1974	1975	1976	1977
MICHIGAN					
E. ½ Upper Peninsula	365	430	241	379	390
W. ½ Upper Peninsula	483	607	323	428	458
N. ½ Lower Peninsula	535	581	523	527	516
S. ½ Lower Peninsula	27	28	11	19	39
Total	1,410	1,646	1,098	1,353	1,403
MINNESOTA					
Northern aspen-birch	789	869	761	708	693
Northern pine	429	520	459	463	480
Central hardwood	48	75	31	37	44
Prairie	3	2	([1])	1	3
Total	1,269	1,466	1,251	1,209	1,220
WISCONSIN					
Northeastern	669	761	568	712	716
Northwestern	623	692	519	622	608
Central	270	379	229	320	275
Southwestern	13	6	4	8	13
Southeastern	6	9	7	10	7
Total	1,581	1,847	1,327	1,672	1,619
Lake States	4,260	4,959	3,676	4,234	4,242

[1]Less than 500 cords.
[2]Includes small quantity of cedar not shown in other parts of table.

Table 9.—*Lake States pulpwood production from roundwood by county and species, 1977*

(In standard cords, roughwood basis)

MICHIGAN

UNIT AND COUNTY 1/	CEDAR	BALSAM FIR	HEMLOCK	JACK PINE	RED PINE	WHITE PINE	SPRUCE	TAMARACK	ASH	ASPEN	BALSAM POPLAR	BASSWOOD
E. UPPER PENINSULA												
ALGER	452	2984	7610	11995	2314	1330	1380	105	204	6623	94	83
CHIPPEWA	168	4152	2237	13545	1382	602	5601	138	76	3497	15	16
DELTA	1023	15185	6329	6509	3348	1853	5764	303	927	35443	4146	183
LUCE	215	4247	5985	16677	1108	619	2641	50	88	2223	454	22
MACKINAC	829	5525	1693	2763	795	467	1017	46	116	4201	1699	0
MENOMINEE	400	10477	2792	268	1036	639	6763	767	3074	42760	4464	57
SCHOOLCRAFT	468	5281	4360	11544	1566	938	4152	109	178	11287	2640	0
TOTAL	3555	47851	31006	63301	11549	6448	27318	1518	4663	106034	13512	361
W. UPPER PENINSULA												
BARAGA	932	6447	6666	3062	2382	1481	2171	220	220	22521	0	317
DICKINSON	102	5061	1333	710	264	165	2007	371	1098	49026	1226	82
GOGEBIC	276	4354	6115	1440	781	437	511	64	92	17695	0	5
HOUGHTON	107	1729	2212	1525	575	168	515	25	95	4274	8	0
IRON	687	14727	5431	3875	3717	1186	8020	412	625	48357	703	73
KEWEENAW	5	30	195	85	45	8	77	1	21	30	0	0
MARQUETTE	852	11252	5091	20645	3271	1907	6620	225	540	22753	3670	41
ONTONAGON	147	1457	3964	666	514	231	284	34	96	30684	0	211
TOTAL	3108	45057	31007	32008	11549	5583	20205	1352	2787	195340	5607	729
N. LOWER PENINSULA												
ALCONA	0	0	0	310	0	0	0	0	472	25930	111	96
ALPENA	0	220	0	585	14	4	16	0	700	9184	44	67
ANTRIM	0	0	0	0	0	0	0	0	0	587	0	33
ARENAC	0	0	0	0	0	0	0	0	10	416	0	10
BENZIE	0	0	0	0	336	0	0	0	208	5824	0	208
CHARLEVOIX	0	0	0	0	671	0	0	0	0	0	0	0
CHEBOYGAN	0	131	0	3123	906	0	44	0	942	8445	44	111
CLARE	0	0	0	3190	0	0	0	0	333	15193	0	208
CRAWFORD	0	0	0	3613	98	51	0	0	107	1184	0	52
EMMET	0	0	0	711	79	42	0	0	0	434	0	0
GLADWIN	0	0	0	232	0	0	0	0	52	6244	0	52
GRAND TRAVERSE	0	0	0	1959	0	0	0	0	52	3963	0	52
IOSCO	0	0	0	11408	761	21	0	0	52	802	0	52
ISABELLA	0	0	0	0	37	0	0	0	39	3712	0	0
KALKASKA	0	12	5	3494	1607	47	0	0	104	9494	0	135
LAKE	0	0	0	5127	0	0	0	0	429	18423	0	416
LEELANAU	0	0	0	0	0	0	0	0	208	832	0	208
MANISTEE	0	0	0	0	1752	0	0	0	315	6037	0	208
MASON	0	0	0	0	37	0	0	0	52	7419	0	52
MECOSTA	0	0	0	0	2699	0	0	0	99	10790	0	52
MIDLAND	0	0	0	0	0	0	0	0	104	3457	0	67
MISSAUKEE	0	0	0	1284	629	0	0	0	53	3144	0	52
MONTMORENCY	0	295	0	8221	345	156	97	0	240	14846	67	22
NEWAYGO	0	0	0	0	6103	0	0	0	103	7896	0	0
OCEANA	0	0	0	0	3222	0	0	0	480	5123	0	208
OGEMAW	0	0	0	5688	0	0	0	0	132	3227	0	52
OSCEOLA	0	0	0	0	2205	0	0	0	45	14183	0	48
OSCODA	0	97	0	8727	241	120	32	0	206	9354	22	48
OTSEGO	0	106	0	5971	228	104	18	0	0	738	0	0
PRESQUE ISLE	0	706	58	3859	152	80	133	0	220	11400	67	22
ROSCOMMON	0	0	0	9226	0	0	0	0	1	8075	0	0
WEXFORD	0	0	0	10259	9572	42	0	0	111	5359	0	104
TOTAL	0	1567	63	86987	31694	667	340	0	5869	221715	355	2635
S. LOWER PENINSULA												
ALLEGAN	0	0	0	1154	1154	0	0	0	6	427	0	0
BARRY	0	0	0	0	240	0	0	0	0	48	0	0
CALHOUN	0	0	0	0	101	0	0	0	0	0	0	0
GRATIOT	0	0	0	0	0	0	0	0	140	584	0	0
KENT	0	0	0	0	368	0	0	0	706	928	0	0
MONTCALM	0	0	0	0	1241	0	0	0	483	3605	0	0
MUSKEGON	0	0	0	0	3797	0	0	0	8	3124	0	0
OTTAWA	0	0	0	0	3855	0	0	0	0	13	0	0
SAGINAW	0	0	0	0	52	0	0	0	1	187	0	0
WASHTENAW	0	0	0	0	114	0	0	0	0	0	0	0
TOTAL	0	0	0	1154	10922	0	0	0	1344	8916	0	0
STATE TOTAL	6663	94475	62076	183450	65714	12698	47863	2870	14663	532005	19474	3725

(Table 9 continued on next page)

TABLE 9 CONTINUED

MINNESOTA

UNIT AND COUNTY 1/	CEDAR	BALSAM FIR	HEMLOCK	JACK PINE	RED PINE	WHITE PINE	SPRUCE	TAMA-RACK	ASH	ASPEN	BALSAM POPLAR	BASS-WOOD
NORTHERN ASPEN-BIRCH												
CARLTON	0	2142	0	4320	547	104	1064	339	0	19970	0	0
COOK	0	3763	0	3391	9	0	9742	0	0	20089	0	0
KOOCHICHING	0	22002	0	14303	1421	363	51589	19894	0	124729	6724	0
LAKE	0	9128	0	20403	592	520	19363	171	0	23341	0	0
ST.LOUIS	0	22485	0	46879	2388	1936	27907	3773	46	186948	5269	0
TOTAL	0	59520	0	89296	4957	2923	109665	24177	46	375077	11993	0
NORTHERN PINE												
AITKIN	0	1013	0	520	0	0	1195	2612	0	24077	0	400
BECKER	0	0	0	1040	0	0	0	22	0	520	0	0
BELTRAMI	0	11872	0	9901	453	78	8506	1763	0	37985	15	0
CASS	0	1770	0	14406	1056	145	1223	1083	0	50447	0	0
CLEARWATER	0	1289	0	2326	297	0	1154	2066	0	13415	0	0
CROW WING	0	104	0	6170	312	104	0	0	0	9352	0	0
HUBBARD	0	734	0	9346	699	22	460	1111	0	24706	0	0
ITASCA	0	22590	0	7125	317	106	14205	2873	0	114701	2451	0
LAKE OF THE WOODS	0	259	0	4888	54	0	12698	2364	0	9162	193	0
MAHNOMEN	0	0	0	1169	0	0	0	109	0	520	0	0
ROSEAU	0	15	0	7503	0	0	3949	1101	0	4692	0	0
WADENA	0	0	0	4464	208	0	0	0	0	2000	0	0
TOTAL	0	39646	0	68858	3396	455	43390	15104	0	291577	2659	400
CENTRAL HARDWOOD												
BENTON	0	0	0	0	0	0	0	0	0	2083	0	400
CHISAGO	0	0	0	0	0	0	0	0	0	104	0	0
HENNEPIN	0	0	0	0	0	0	0	0	0	0	0	0
KANABEC	0	0	0	0	0	0	0	0	0	2780	0	400
MILLE LACS	0	0	0	0	0	0	0	253	0	5060	0	400
MORRISON	0	0	0	1040	0	0	5	0	0	8100	0	400
OTTER TAIL	0	0	0	520	0	0	0	28	0	0	0	0
PINE	0	0	0	1377	0	0	0	0	0	12067	0	0
RAMSEY	0	0	0	0	0	0	0	0	0	0	0	0
TODD	0	0	0	574	0	0	0	0	0	0	0	0
TOTAL	0	0	0	3511	0	0	5	281	0	30194	0	1600
PRAIRIE												
POLK	0	0	0	0	0	0	0	2356	0	0	0	0
TOTAL	0	0	0	0	0	0	0	2356	0	0	0	0
STATE TOTAL	0	99166	0	161665	8353	3378	153060	41918	46	696848	14652	2000

TABLE 9 CONTINUED ON NEXT PAGE

TABLE 9 CONTINUED

WISCONSIN

UNIT AND COUNTY 1/	CEDAR	BALSAM FIR	HEMLOCK	JACK PINE	RED PINE	WHITE PINE	SPRUCE	TAMA-RACK	ASH	ASPEN	BALSAM POPLAR	BASS-WOOD
NORTHEASTERN												
FLORENCE	19	3958	1686	465	1614	197	993	97	75	38054	0	0
FOREST	76	12398	5093	1287	4965	139	3180	252	1570	43249	0	95
LANGLADE	0	2110	1052	124	700	3	224	377	1374	11425	0	241
LINCOLN	234	7463	3090	1407	3731	425	1488	503	1338	35745	0	1899
MARINETTE	131	7932	1488	10833	3363	311	1321	41	1027	75494	0	0
OCONTO	0	2136	362	1634	8564	400	275	9	113	27017	0	0
ONEIDA	5	12787	843	7305	8831	430	5139	275	1167	48176	0	909
SHAWANO 2/	0	869	15095	271	1037	67	0	28	773	19601	0	10
VILAS	255	6980	3196	4934	3877	1615	2785	213	108	36034	0	235
TOTAL	720	56633	31905	28260	36682	3587	15405	1795	7545	334795	0	3389
NORTHWESTERN												
ASHLAND	319	6289	2087	3094	2884	651	1292	172	1726	40127	0	274
BARRON	0	0	0	580	73	26	0	0	0	0	0	0
BAYFIELD	5	1286	128	8220	2283	195	53	1	310	61134	0	7
BURNETT	0	69	0	18020	2080	724	0	0	29	235	0	0
DOUGLAS	0	206	0	27065	4868	276	22	163	89	21718	0	0
IRON	24	826	757	896	543	162	274	61	380	50026	0	453
POLK	0	0	0	1355	8	5	0	0	0	0	0	0
PRICE	140	3684	1865	1244	3259	276	776	493	3125	36145	0	1794
RUSK	0	265	288	87	5	0	10	36	745	8361	0	280
SAWYER	2	814	2306	3905	2264	267	475	41	2178	40574	0	351
TAYLOR	52	1593	1019	286	659	92	199	444	1637	21233	55	674
WASHBURN	0	56	0	13947	1880	665	58	68	111	48848	0	0
TOTAL	542	15088	8450	78699	20806	3339	3159	1479	10330	328401	55	3833
CENTRAL												
ADAMS	0	0	0	21114	5066	570	0	0	8	84	0	0
CHIPPEWA	8	76	440	207	458	15	18	305	577	8641	0	503
CLARK	0	49	128	1621	1109	1005	0	42	259	1960	0	49
EAU CLAIRE	0	0	0	3888	1309	0	0	0	16	349	0	0
JACKSON	0	0	0	12836	3294	500	0	6	54	79	0	0
JUNEAU	0	0	0	16549	3936	322	0	26	112	482	0	0
MARATHON	0	1457	2290	927	864	167	15	108	572	7453	0	113
MARQUETTE	0	0	0	1690	1274	73	0	68	63	0	0	0
MONROE	0	0	0	3214	1444	167	0	0	72	24	0	0
PORTAGE	0	19	204	3047	2481	975	0	26	9	3294	0	0
WAUPACA	0	9	54	995	1322	337	0	41	235	6727	0	0
WAUSHARA	0	0	0	3121	4410	396	0	83	18	150	0	0
WOOD	0	0	0	9278	1548	1372	6	0	256	2425	0	19
TOTAL	8	1610	3116	78487	28515	5899	39	705	2251	31668	0	684
SOUTHWESTERN												
BUFFALO	0	0	0	66	64	5	0	0	0	0	0	0
CRAWFORD	0	0	0	0	0	0	0	0	0	30	0	0
DUNN	0	0	0	964	1035	80	0	0	0	0	0	0
GRANT	0	0	0	7	6	0	0	0	116	665	0	273
IOWA	0	0	0	61	60	16	0	0	0	0	0	0
LACROSSE	0	0	0	362	445	90	0	0	0	0	0	0
PEPIN	0	0	0	20	18	14	0	0	0	0	0	0
RICHLAND	0	0	0	18	0	41	0	0	0	0	0	0
SAUK	0	0	0	933	2114	171	0	0	2	0	0	0
TREMPEALEAU	0	0	0	732	699	41	0	0	0	0	0	0
TOTAL	0	0	0	3163	4441	458	0	0	118	695	0	273
SOUTHEASTERN												
BROWN	0	0	0	9	40	3	0	0	0	0	0	0
COLUMBIA	0	0	0	104	1232	0	0	0	176	0	0	0
DANE	0	0	0	54	3	0	0	0	0	0	0	0
GREEN	0	0	0	29	315	45	0	0	0	0	0	0
GREEN LAKE	0	0	0	2	8	1	0	0	0	0	0	0
MANITOWOC	0	0	0	0	0	0	0	0	0	5	0	0
OUTAGAMIE	0	0	0	10	42	3	0	0	72	660	0	0
ROCK	0	0	0	9	2	0	0	0	0	0	0	0
WAUKESHA	0	0	0	968	1216	80	0	0	0	0	0	0
TOTAL	0	0	0	1185	2858	132	0	0	248	665	0	0
STATE TOTAL	1270	73331	43471	189794	93302	13415	18603	3979	20492	696224	55	8179

TABLE 9 CONTINUED ON NEXT PAGE

1/ INCLUDES ONLY THOSE COUNTIES THAT SUPPLIED PULPWOOD IN 1977.
2/ INCLUDES MENOMINEE COUNTY.

TABLE 9 CONTINUED

MICHIGAN

UNIT AND COUNTY 1/	BEECH	WHITE BIRCH	YELLOW BIRCH	COTTON-WOOD	ELM	HICKORY	HARD MAPLE	SOFT MAPLE	RED OAK	WHITE OAK	OTHER HARD-WOODS	ALL SPECIES
E. UPPER PENINSULA												
ALGER	2198	2917	708	0	613	0	2788	3759	57	0	67	48281
CHIPPEWA	392	692	176	0	112	0	905	654	27	0	11	34398
DELTA	1003	5758	1296	0	2040	0	5640	5004	226	0	195	102175
LUCE	879	1084	242	0	207	0	1566	1043	50	0	21	39421
MACKINAC	810	1458	42	0	222	0	513	394	0	0	26	22616
MENOMINEE	291	3704	1240	0	5715	0	4909	3580	100	0	495	93531
SCHOOLCRAFT	425	2384	377	0	511	0	1837	910	121	0	54	49142
TOTAL	5998	17997	4081	0	9420	0	18158	15344	581	0	869	389564
W. UPPER PENINSULA												
BARAGA	0	1997	2004	0	1968	0	6812	3546	100	0	356	63202
DICKINSON	89	3296	718	0	1490	0	3710	1966	111	0	193	73018
GOGEBIC	0	533	1597	0	1618	0	3277	1229	4	0	321	40349
HOUGHTON	0	676	1060	0	1177	0	2342	893	6	0	221	17608
IRON	0	2756	4233	0	5234	0	10934	4716	125	0	901	116712
KEWEENAW	0	25	14	0	93	0	343	82	0	0	8	1062
MARQUETTE	36	6543	1628	0	1632	0	5986	3755	365	0	160	96972
ONTONAGON	0	462	1655	0	1653	0	3709	3222	0	0	334	49323
TOTAL	125	16288	12909	0	14865	0	37113	19409	711	0	2494	458246
N. LOWER PENINSULA												
ALCONA	86	1609	0	0	0	0	110	2555	9997	1150	16	42442
ALPENA	100	1056	0	0	0	0	160	2997	696	110	0	15953
ANTRIM	0	0	0	0	0	0	0	104	0	0	0	724
ARENAC	0	60	0	0	0	0	0	52	0	0	7	555
BENZIE	104	440	0	0	0	0	104	2600	728	104	40	10696
CHARLEVOIX	0	0	0	0	0	0	0	0	0	0	0	671
CHEBOYGAN	140	521	0	0	0	0	243	3858	213	26	0	18747
CLARE	322	380	0	0	0	0	354	3485	8097	507	161	32230
CRAWFORD	104	78	0	0	0	0	32	1109	3854	150	26	10458
EMMET	0	58	0	0	0	0	0	89	0	0	0	1413
GLADWIN	7	670	0	0	0	0	0	742	1040	104	0	9143
GRAND TRAVERSE	104	129	0	0	0	0	104	759	111	53	52	7338
IOSCO	0	19	0	0	0	0	0	728	477	50	0	14370
ISABELLA	12	33	0	0	0	0	70	245	1342	258	4	5752
KALKASKA	208	215	0	0	0	0	52	2080	2080	208	52	19793
LAKE	417	131	0	0	0	0	231	7385	14245	677	104	47585
LEELANAU	104	58	0	0	0	0	104	208	297	104	104	2227
MANISTEE	306	291	0	0	0	0	347	4337	2970	430	129	17122
MASON	124	385	0	0	0	0	104	3208	4314	114	93	15902
MECOSTA	38	114	0	0	0	0	121	318	2350	152	10	16743
MIDLAND	52	226	0	0	0	0	0	1144	416	0	0	5466
MISSAUKEE	52	197	0	0	0	0	3	1055	1666	155	52	8342
MONTMORENCY	40	653	0	0	0	0	60	1214	4658	410	0	31324
NEWAYGO	81	107	0	0	0	0	155	667	4629	966	13	20720
OCEANA	448	72	0	0	0	0	732	442	2351	867	144	14089
OGEMAW	104	210	0	0	0	0	20	727	3050	630	47	13887
OSCEOLA	55	291	0	0	0	0	101	825	2396	353	6	20508
OSCODA	46	608	0	0	0	0	66	1215	2604	281	89	23756
OTSEGO	0	0	0	0	0	0	0	0	110	0	0	7275
PRESQUE ISLE	20	1933	0	0	0	0	40	1303	1253	159	0	21405
ROSCOMMON	0	151	0	0	0	0	2	1152	4736	64	0	23407
WEXFORD	104	164	0	0	0	0	118	4747	5151	309	135	36175
TOTAL	3178	10859	0	0	0	0	3433	51350	85831	8391	1284	516218
S. LOWER PENINSULA												
ALLEGAN	0	12	0	0	0	0	12	60	420	90	0	3335
BARRY	0	0	0	0	0	0	0	0	0	0	0	288
CALHOUN	0	0	0	0	0	0	0	0	0	0	0	101
GRATIOT	50	0	0	0	0	0	110	271	279	174	43	1651
KENT	315	1	0	0	0	0	685	1172	2694	1611	215	8695
MONTCALM	180	15	0	0	0	0	438	1352	3741	1956	183	13194
MUSKEGON	0	16	0	0	0	0	16	80	605	154	0	7800
OTTAWA	0	0	0	0	0	0	0	0	0	0	0	3868
SAGINAW	0	2	0	0	0	0	2	13	88	19	0	364
WASHTENAW	0	0	0	0	0	0	0	0	0	0	0	114
TOTAL	545	46	0	0	0	0	1263	2948	7827	4004	441	39410
STATE TOTAL	9846	45190	16990	0	24285	0	59967	89051	94950	12395	5088	1403438

MINNESOTA

UNIT AND COUNTY 1/	CEDAR	BALSAM FIR	HEMLOCK	JACK PINE	RED PINE	WHITE PINE	SPRUCE	TAMA-RACK	ASH	ASPEN	BALSAM POPLAR	BASS-WOOD
NORTHERN ASPEN-BIRCH												
CARLTON	0	3139	0	0	0	0	20	9	0	0	0	31654
COOK	0	0	0	0	0	0	0	0	0	0	0	36994
KOOCHICHING	0	1906	0	0	0	0	37	44	0	0	0	243012
LAKE	0	2211	0	0	0	0	0	0	0	0	0	75729
ST.LOUIS	0	8114	3	0	59	0	41	169	0	0	0	306017
TOTAL	0	15370	3	0	59	0	98	222	0	0	0	693406
NORTHERN PINE												
AITKIN	0	1416	0	0	75	0	0	75	941	38	0	32362
BECKER	0	0	0	0	0	0	0	0	0	0	0	1582
BELTRAMI	0	4202	0	0	0	0	164	8	0	0	0	74947
CASS	0	2550	0	0	0	0	29	7	0	0	0	72716
CLEARWATER	0	552	0	0	0	0	75	6	0	0	0	21180
CROW WING	0	624	0	0	0	0	0	0	0	0	0	16666
HUBBARD	0	1040	0	0	0	0	0	0	0	0	0	38118
ITASCA	0	1164	0	0	0	0	160	46	0	0	0	165738
LAKE OF THE WOODS	0	0	0	0	0	0	0	0	0	0	0	29618
MAHNOMEN	0	0	0	0	0	0	0	0	0	0	0	1798
ROSEAU	0	1040	0	0	0	0	0	0	0	0	0	18300
WADENA	0	104	0	0	0	0	0	0	0	0	0	6776
TOTAL	0	12692	0	0	75	0	428	142	941	38	0	479801
CENTRAL HARDWOOD												
BENTON	0	376	0	0	75	0	0	75	941	38	0	3988
CHISAGO	0	0	0	0	0	0	0	0	0	0	0	104
HENNEPIN	0	0	0	0	944	0	0	0	0	0	0	944
KANABEC	0	376	0	0	75	0	0	75	941	38	0	4685
MILLE LACS	0	376	0	0	75	0	0	75	941	38	0	7218
MORRISON	0	376	0	0	75	0	0	75	941	38	0	11050
OTTER TAIL	0	0	0	0	0	0	0	0	0	0	0	548
PINE	0	474	0	0	0	0	0	0	0	0	0	13918
RAMSEY	0	0	0	0	944	0	0	0	0	0	0	944
TODD	0	0	0	0	0	0	0	0	0	0	0	574
TOTAL	0	1978	0	0	2188	0	0	300	3764	152	0	43973
PRAIRIE												
POLK	0	0	0	0	0	0	0	0	0	0	0	2356
TOTAL	0	0	0	0	0	0	0	0	0	0	0	2356
STATE TOTAL	0	30040	3	0	2322	0	526	664	4705	190	0	1219536

TABLE 9 CONTINUED ON NEXT PAGE

TABLE 9 CONTINUED

WISCONSIN

UNIT AND COUNTY 1/	BEECH	WHITE BIRCH	YELLOW BIRCH	COTTON-WOOD	ELM	HICKORY	HARD MAPLE	SOFT MAPLE	RED OAK	WHITE OAK	OTHER HARD-WOODS	ALL SPECIES
NORTHEASTERN												
FLORENCE	0	1476	328	0	16552	0	1664	10244	372	0	103	77897
FOREST	2	3136	1060	0	8507	0	9180	1835	17	0	2094	98135
LANGLADE	0	2039	901	0	14176	78	7916	6268	493	0	1243	50744
LINCOLN	0	3221	503	0	9108	0	2395	6024	1052	0	110	79736
MARINETTE	0	11367	165	0	2585	0	1130	1648	0	0	308	119144
OCONTO	0	2092	67	0	323	10	329	321	0	0	11	43663
ONEIDA	0	15314	2104	0	2186	2	3087	4357	2558	0	222	115697
SHAWANO 2/	0	485	409	0	6001	600	2618	1146	14	0	427	49451
VILAS	0	8459	648	0	4399	0	3668	3367	558	4	90	81425
TOTAL	2	47589	6185	0	63837	690	31987	35210	5064	4	4608	715892
NORTHWESTERN												
ASHLAND	0	2314	481	0	3433	0	4335	2493	133	0	285	72389
BARRON	0	478	0	0	0	0	0	0	0	0	0	1157
BAYFIELD	0	12540	1027	0	523	0	732	452	513	60	61	89530
BURNETT	0	41	10	0	31	0	48	45	0	0	2	21334
DOUGLAS	0	2207	51	0	70	0	123	91	0	0	6	56955
IRON	0	2275	136	0	2555	0	646	1738	222	0	18	61992
POLK	0	0	0	0	0	0	0	0	0	0	0	1368
PRICE	0	7034	983	0	16805	0	4738	3173	876	30	303	86743
RUSK	0	2578	336	0	5476	0	1452	3700	545	7	55	24226
SAWYER	0	5620	627	0	7615	0	4328	4677	915	14	349	77322
TAYLOR	0	4014	627	0	8800	0	3835	2386	372	8	129	48114
WASHBURN	0	642	42	0	88	0	150	114	0	0	8	66677
TOTAL	0	39743	4320	0	45396	0	20387	18869	3576	119	1216	607807
CENTRAL												
ADAMS	0	7	3	0	13	0	8	22	6163	1685	1	34744
CHIPPEWA	0	1328	524	0	1286	0	781	1027	261	0	22	16477
CLARK	0	334	113	0	475	0	366	583	8911	2286	35	19325
EAU CLAIRE	0	24	5	0	26	0	19	42	62	18	3	5761
JACKSON	0	108	24	0	103	0	98	160	870	235	10	18377
JUNEAU	0	211	49	0	207	0	200	318	3875	1142	15	27444
MARATHON	1	564	210	0	35101	20	2190	22941	2230	0	161	77384
MARQUETTE	0	47	9	0	1898	0	354	1163	0	0	25	6664
MONROE	0	193	45	0	169	0	218	281	0	0	1	5828
PORTAGE	0	18	3	0	67	0	142	274	3744	1069	1	15373
WAUPACA	0	247	108	0	906	66	525	506	0	0	54	12132
WAUSHARA	0	84	17	0	52	0	84	86	522	152	0	9175
WOOD	0	237	72	0	245	0	215	504	8266	2162	22	26627
TOTAL	1	3402	1182	0	40548	86	5200	27907	34904	8749	350	275311
SOUTHWESTERN												
BUFFALO	0	0	0	0	0	0	0	0	0	0	0	135
CRAWFORD	0	0	0	0	0	0	0	0	0	0	0	30
DUNN	0	0	0	0	0	0	0	0	0	0	0	2079
GRANT	0	223	0	44	512	253	219	302	1657	623	105	5005
IOWA	0	0	0	0	0	0	0	0	0	0	0	137
LACROSSE	0	0	0	0	0	0	0	0	0	0	0	897
PEPIN	0	0	0	0	0	0	0	0	0	0	0	52
RICHLAND	0	0	0	0	0	0	0	0	0	0	0	59
SAUK	0	3	0	0	7	0	4	4	0	0	1	3239
TREMPEALEAU	0	0	0	0	0	0	0	0	0	0	0	1472
TOTAL	0	226	0	44	519	253	223	306	1657	623	106	13105
SOUTHEASTERN												
BROWN	0	0	0	0	0	0	0	0	0	0	0	52
COLUMBIA	6	25	9	0	259	0	121	94	0	0	88	2114
DANE	0	0	0	0	0	0	0	0	0	0	0	57
GREEN	0	0	0	0	0	0	0	0	0	0	0	389
GREEN LAKE	0	0	0	0	0	0	0	0	0	0	0	11
MANITOWOC	0	0	0	0	0	0	0	0	0	0	0	5
OUTAGAMIE	0	360	72	0	216	0	360	360	0	0	0	2155
ROCK	0	0	0	0	0	0	0	0	0	0	0	11
WAUKESHA	0	0	0	0	0	0	0	0	0	0	0	2264
TOTAL	6	385	81	0	475	0	481	454	0	0	88	7058
STATE TOTAL	9	91345	11768	44	150775	1029	58278	82746	45201	9495	6368	1619173

1/ INCLUDES ONLY THOSE COUNTIES THAT SUPPLIED PULPWOOD IN 1977.
2/ INCLUDES MENOMINEE COUNTY.

Table 10. — *Central States pulpwood production by State and destination, 1973-1977*
(In thousand standard cords, roughwood basis)

Year	Illinois			Indiana			Iowa			Missouri		
		Destination			Destination			Destination			Destination	
	Total	Central States	Other States	Total	Central States	Other States	Total	Central States	Other States	Total	Central States	Other States
1973	146	124	22	148	80	68	48	46	2	112	63	49
1974	131	98	33	159	84	75	59	57	2	137	77	60
1975	105	60	45	135	58	77	50	48	2	116	43	73
1976	116	65	51	172	78	94	45	41	4	132	55	77
1977	111	53	58	161	66	95	50	46	4	123	44	79

Table 11. — *Trends in receipts of roundwood and residue as pulpwood, Central States, 1973-1977*
(In thousand standard cords, roughwood basis)

Type of Material and Area	1973	1974	1975	1976	1977
Roundwood					
Illinois	70	56	13	18	24
Indiana, Iowa, Missouri	106	93	74	81	62
Total	176	149	86	99	86
Residue					
Illinois	122	104	64	71	62
Indiana, Iowa, Missouri	81	100	86	102	98
Total	203	204	150	173	160
All Material	379	353	236	272	246

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Discusses 1977 pulpwood production and receipts and recent production in the Lake States and Central States. Shows pulpwood production in the Lake States (Michigan, Minnesota, and Wisconsin) by species for each county and compares production by Forest Survey Unit with that of previous years. Presents 1977 pulpwood production and receipts data by State for the Central States (Illinois, Indiana, Iowa, and Missouri), and shows four production classes by county.

OXFORD: 861.0(77):792. KEY WORDS: roundwood, residue, receipts, Lake States, Central States.

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More bicycles and shoe leather...less smog.